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EXAMINER

MARKHAM, WESLEY D

ART UNIT PAPER NUMBER

1762

3

DATE MAILED: 11/29/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No

09/827,462

Applicant(s)

DEFLINGER ET AL

Examiner

Wesley D Markham

Art Unit

1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is **FINAL** 2b) ☒ This action is non final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 19-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 19-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 06 April 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/253,212.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other

DETAILED ACTION

Acknowledgement is made of applicant's preliminary amendment A, filed as paper #2 on April 6, 2001, in which Claims 1 – 18 were canceled and Claims 19 – 38 were added. Claims 19 – 38 are currently pending in U.S. application serial # 09/827,462, and an Office Action on the merits follows.

Drawings

1. This application has been filed with informal drawings which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.

Specification

2. 35 U.S.C. 112, first paragraph, requires the specification to be written in "full, clear, concise, and exact terms." The specification is replete with terms which are not clear, concise and exact. The specification should be revised carefully in order to comply with 35 U.S.C. 112, first paragraph. Examples of some unclear, inexact or verbose terms used in the specification are, for example, "Building generally on tools in which the provided hard material layer in the active edge region has substantially, and within the scope of measurability, an unchanged material composition as well as on tools in which, in contrast to first stated, the composition of the hard material layer in the active edge region is changed, each relative to the hard material layer composition on the remaining tool regions. it is the task of the present invention to

propose a process for the protective coating of machining tools as well as a set of at least two tools, by means of which substantially improved specific working properties are attained" (pg. 2 – 3 of specification); and "According to the invention it was consequently found that the estimating, previously described effective specifications of changed or unchanged compositions of hard material layers in the active edge regions of machining tools are not permissible, that namely, as a function of the working purpose of the tools, one time a hard material coating of constant composition and another time a hard material of varying composition in the active edge region in practice, i.e. when applying the tool, only leads to critical improvements (pg. 3 – 4 of specification). It appears to the examiner that the errors in the specification can be corrected by a thorough review of the specification in order to put the specification into terms / sentences which correspond to proper English syntax / grammar.

3. In addition, the disclosure is objected to because of the following informalities.

- Page 10 – The statement, "The parameters described under B yield layers which in the active edge region have a strong depletion of the aluminum, namely from 50 at% (on the edge) to 40 at%, or an enrichment of titanium from 50 at% (on the edge) to 60 at%. according to Figure 2" is confusing because it does not correspond with the data shown in Figure 2. Specifically, Figure 2 appears to show an enrichment of aluminum from 50 at% to 60 at% and a depletion of titanium from 50 at% to 40 at%, which is the opposite situation than the situation described in the specification.

Art Unit: 1762

- The use of the trademarks AISI 304SS, DIN 1.4306, AISI 4140, DIN 1.7225, SEE 42TN, SKD 61, DIN 1.2344, HSS, AISI D3, DIN 1.2080, GG 25, DIN 1.2311, AISI D2, DIN 1.237, J97, DIN 1.2343, SNGA 120408, BAJ 1200, K903/SEHW43A6T, and Jarbo have been noted in this application. They should be capitalized wherever they appear and be accompanied by the generic terminology. Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

Appropriate correction is required.

Claim Objections

4. Claims 19 and 37 - 38 are objected to because of the following informalities

- Claim 19 – The phrase, “selecting said first hard material coating to have a content at least two of said metal elements which is at most 2at% different from a content...” is improper grammar. The applicant is suggested to amend the phrase to read, “selecting said first hard material coating to have a content of at least two of said metal elements which is at most 2at% different from a content...”
- Claim 37 – The phrase, “...a content of said at least two metal element which is ...” is improper grammar. The applicant is suggested to amend

the phrase to read, "...a content of said at least two metal elements which is ..."

- Claim 38 – The phrase, "and further selecting the content of aluminum in the material composition of said first hard material coating to be from the content of said Al of said second hard material coating by more than 2 at%..." is unclear. The applicant is suggested to amend the phrase to read, "and further selecting the content of aluminum in the material composition of said first hard material coating to be different from the content of said Al of said second hard material coating by more than 2 at%..."

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 19 – 38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
7. Specifically, the term "hard" in claim 19 is a relative term which renders the claim indefinite. The term "hard" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in

Art Unit: 1762

the art would not be reasonably apprised of the scope of the invention. It is unclear how "hard" the material (i.e., coating) is required to be.

8. In addition, the terms "high adhesive strength" and "high hardness" in Claims 19 and 37 – 38 are relative terms which render the claims indefinite. The terms "high adhesive strength" and "high hardness" are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is unclear what range of adhesive strengths and hardness values are encompassed by this limitation.
9. Also regarding Claims 19 and 38, the claims are unclear because the applicant appears to be claiming (1) the coating process wherein the coating has a composition difference of at most 2 at% in some situations, and (2) the coating process wherein the coating has a composition difference of more than 2 at% in other situations. Both of these situations cannot be present simultaneously (i.e., the coating cannot be selected to have both a composition difference of at most 2 at% and a composition difference of more than 2 at%). Therefore, for purposes of examination only, the examiner has interpreted the conjunction linking the final two paragraphs of Claim 19 and the final two limitations of Claim 38 (Claim 38, line 8) to be "or" instead of "and".
10. Also regarding Claims 19 and 37 – 38, the limitations, "if the tool being produced must fulfill a requirement of high adhesive strength of the first hard material coating to a higher degree than a requirement of hardness of said first hard material

Art Unit: 1762

coating" and "if the tool being produced must fulfill a requirement of high hardness of said first hard material coating to a higher degree than a requirement of high adhesive strength of said first hard material coating" are vague and indefinite. Specifically, it is unclear what is meant by "requirements" in the Claim. Who sets / decides the requirements? What are the requirements? What tools have each requirement? It appears to the examiner that this claim limitation is subjective and would depend on who is setting the "requirements".

11. Regarding Claim 27, the claim is unclear because the applicant appears to be claiming (1) the coating process wherein the coating has a composition difference of at most 2 at% in some situations, and (2) the coating process wherein the coating has a composition difference of more than 2 at% in other situations. Both of these situations cannot be present simultaneously (i.e., the coating cannot be selected to have both a composition difference of at most 2 at% and a composition difference of more than 2 at%). Therefore, for purposes of examination only, the examiner has interpreted the conjunction linking the final two limitations of Claim 27 (Claim 27, line 7) to be "or" instead of "and".
12. In addition, the terms "larger cross-sectional area", "lower cutting rate", "smaller cross-sectional area", and "larger cutting rate" in Claim 27 are relative terms which render the claims indefinite. The terms "larger cross-sectional area", "lower cutting rate", "smaller cross-sectional area", and "larger cutting rate" are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the

scope of the invention. It is unclear what range of cross-sectional areas are "larger" and what range are "smaller". It is also unclear what range of cutting rates are "lower" and what range are "larger".

13. Regarding Claims 33 – 38, the term "hard" is a relative term which renders the claims indefinite. The term "hard" is not defined by the claims, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.
14. Regarding Claims 34 – 35, the phrase "shank-type" renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by "type"), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).
15. Claims 34 – 35 contain the trademarks/trade names AISI 304 SS, DIN 1.7226, SEE42TN, SKD 61, DIN 1.2344, HSS, AISI D3, DIN 1.2080, GG25, DIN 1.2311, AISI D2, DIN 1.2379, J97 (Jabro), and DIN 1.2343. Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark

or trade name. In the present case, the trademarks/trade names are used to identify/describe types of materials and types of tools / tool components and, accordingly, the identification/description is indefinite.

Claim Rejections - 35 USC § 102

16. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States

17. Claims 19 – 21, 27, 32 – 33, 36, and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Leyendecker et al. (USPN 5,272,014).
18. Regarding Claim 19, Leyendecker et al. teach a method for producing cutting tools (Col.2, lines 61 – 66) comprising the steps of providing on a first region of a tool body that contains at least one first cutting edge, a first hard material coating by means of a plasma vacuum coating process; providing on a second region of the tool body that is adjacent to said first region, a second hard material coating by means of a plasma vacuum coating process (Abstract, Example 1, Figures 1 – 2, and Col.3, lines 6 – 26); selecting as hard material for the first and second hard material coatings, a material selected from the group consisting of carbides, oxides, oxycarbides, nitrides, nitrocarbides, oxinitrides, and nitrooxycarbides of at least two of the metal elements Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, and Al (Col.1, lines 50 – 54,

Art Unit: 1762

Col.3, lines 45 – 58, and Example 1); and selecting the first hard material coating to have a content of at least two of the metal elements to be different from the content of the two metal elements of the second hard material by more than 2at% if the tool being produced must fulfill a requirement of high hardness of the first hard material coating to a higher degree than a requirement of high adhesive strength of the first hard material coating (Abstract, Figures 1 – 2, and Col.2, lines 50 – 66).

Specifically, Leyendecker et al. teach that the inhomogeneous coating (i.e., the coating wherein the first hard material coating has a content of at least two of the metal elements to be different from the content of the two metal elements of the second hard material by more than 2at%) is useful when coating cutting tools, milling tools, shaping tools, punches, drills, and similar apparatuses (Col.2, lines 61 – 68, and Col.3, lines 1 – 10). It appears from the applicant's specification and claims that tools which must fulfill a requirement of high hardness of the first hard material coating to a higher degree than a requirement of high adhesive strength of the first hard material coating include a number of milling tools and cutting tools. Leyendecker et al. teach coating these types of tools with the applicant's claimed coating / method. As it has been previously established that, for purposes of examination only, the examiner has interpreted the conjunction linking the final two paragraphs of Claim 19 to be "or" instead of "and" in order to render the claim definite (see paragraph 9 above), Leyendecker et al. teach all the limitations of Claim 19 as set forth above. It should also be noted the Leyendecker et al. also teach coating a drill with a homogeneous (Ti,Al)N coating (Example 1) and that a

Art Unit: 1762

drill appears from the applicant's specification and claims to be included in the group of tools which must fulfill a requirement of high adhesive strength of the first hard material coating to a higher degree than a requirement of hardness of the first hard material coating.

19. Leyendecker et al. also teach all the limitations of Claims 20 – 21, 27, 32 – 33, 36, and 38 as set forth above in paragraph 18 and below, including a method wherein / further comprising:

- Claim 20 – At least a part of the hard material coatings comprise (Ti,Al)N (Col.3, lines 48 – 58, and Example 1).
- Claim 21 – The step of providing an intermediate layer between the tool body and the hard material coatings (Col.4, lines 7 – 19).
- Claim 27 – See paragraph 18 above. Also, see paragraph 11 above for the reasons why, for purposes of examination only, the examiner has interpreted the conjunction linking the final two limitations of Claim 27 (Claim 27, line 7) to be “or” instead of “and”. Leyendecker et al. teach applying the first hard material coating to have a content of the at least two metal elements to be different by more than 2 at% with respect to the content of the at least two metal elements in the second hard material coating for cutting tools. The statement that the tools are “for cutting with smaller cross-sectional area of the cut at a larger cutting rate” is simply a statement of intended use and is not read into the claim. In addition, as the method / coating of Leyendecker et al. is the same as the method /

coating claimed by the applicant, the cutting tools of Leyendecker et al. would have been capable of "cutting with smaller cross-sectional area of the cut at a larger cutting rate" as claimed by the applicant.

- Claim 32 – The step of applying the first hard material coating to have a content of at least two of the metal elements to be different from the content of the at least two metal elements in the second hard material by more than 2at% for tool bodies for cutting workpiece materials having a hardness of more than 45 Rockwell and a tensile strength of more than 1500 N/mm². Specifically, Leyendecker et al. teach that cutting tools are coated by their process (Col.2, lines 61 – 68, and Col.3, lines 1 – 10). Simply stating that the tools are for cutting a specific type of workpiece material is a statement of intended use and is not read into the claim. In addition, as the method / coating of Leyendecker et al. is the same as the method / coating claimed by the applicant, the cutting tools of Leyendecker et al. would have been capable of cutting the materials claimed by the applicant.
- Claim 33 – The tool body is a tool for hard chipping. Specifically, Leyendecker et al. teach that tools such as milling tools, punches, and drills are coated by their process (Col.2, lines 61 – 68, and Col.3, lines 1 – 10). Simply stating that the tools are for "hard chipping" is a statement of intended use and is not read into the claim. In addition, as the method / coating of Leyendecker et al. is the same as the method / coating claimed

by the applicant, the tools of Leyendecker et al. would have been capable of "hard chipping" as claimed by the applicant.

- Claim 36 – The first and second hard material coatings comprise at least one (Ti,Al)N layer (Figures 1 – 2, Col.3, lines 48 – 58, and Example 1).
- Claim 38 – See paragraph 18 above. Also see paragraph 9 above, which sets forth the reason that the conjunction linking the final two limitations of Claim 38 (Claim 38, line 8) has been interpreted to be "or" instead of "and". Leyendecker et al. teach selecting the content of aluminum in the material composition of the first hard material coating to be different from the content of aluminum of the second hard material coating by more than 2 at%. if the tool being produced must fulfill a requirement of high hardness of the first hard material coating to a higher degree than a requirement of high adhesive strength of the first hard material coating (Abstract, Figure 1, Example 1, Col.2, lines 61 – 68, Col.3, lines 1 – 10, and Col.5, lines 5 – 10). It appears from the applicant's specification and claims that tools which must fulfill a requirement of high hardness of the first hard material coating to a higher degree than a requirement of high adhesive strength of the first hard material coating include a number of milling tools and cutting tools. Leyendecker et al. teach coating these types of tools with the applicant's claimed coating / method.

Claim Rejections - 35 USC § 103

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

21. Claims 22, 25, 28 – 31, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leyendecker et al. (USPN 5,272,014).

22. Leyendecker et al. teach all the limitations of Claim 22 as set forth in paragraph 18 above, except the method wherein the coatings are deposited by means of arc evaporation. However, Leyendecker et al. teach the embodiment of coating the tools using a target sputtering method in general without explicitly teaching arc evaporation (Example 1). Leyendecker et al. also teach that electric arc evaporation is a specific type of target sputtering method that is used to deposit hard films on tools (Col. 1, lines 28 – 36). Therefore, it would have been obvious to one of ordinary skill in the art to use arc evaporation as the target sputtering method in the process of Leyendecker et al. with the reasonable expectation of success.

23. Leyendecker et al. teach all the limitations of Claim 25 as set forth in paragraph 18 above, except the method including selecting the first hard material coating to have a content of the at least two metal elements at most 2 at% different from the content of the metal elements in the second hard material coating for tool bodies of drills, roughing milling cutters, peripheral milling cutters, tools for hobbing machines or

Art Unit: 1762

turning tools. However, Leyendecker et al. do teach coating a drill with a homogeneous (Ti,Al)N coating (Example 1). Leyendecker et al. do not explicitly teach that the "homogeneous" coating is equivalent to a coating wherein the first hard material coating has a content of the at least two metal elements of at most 2 at% different from the content of the metal elements in the second hard material coating. However, Leyendecker et al. teach that a coating which is not homogeneous has a concentration difference of at least about 2 at% (Abstract). Therefore, it would have been obvious to one of ordinary skill in the art to choose deposition parameters to obtain a coating which has a concentration difference of at most 2 at% in the comparative example of Example 1 (i.e., the homogeneous coating on the drill) with the reasonable expectation that, if the concentration difference was more than 2 at%, the coating would be considered by Leyendecker et al. to be not homogeneous. This situation (i.e., the situation wherein the concentration difference is more than 2 at%) would have defeated the purpose of the comparative example of Example 1.

24. Leyendecker et al. teach all the limitations of Claim 28 as set forth in paragraph 18 above, except the method further comprising the step of applying the first hard material coating to have a content of the at least two metal elements to be different from the content of the at least two metal elements in the second hard material coating by at most 2 at% for tool bodies for cutting workpiece material having a hardness of up to at most 45 Rockwell and a tensile strength of up to at most 1500 N/mm². However, Leyendecker et al. teach coating a drill with a homogeneous

Art Unit: 1762

(Ti,Al)N coating (Example 1). One of ordinary skill in the art would have coated the drill with a coating having a concentration difference of at most 2 at% in order to achieve the homogeneous coating of Leyendecker et al. for the reasons set forth in paragraph 23 above. The statement that the coating is "for tool bodies for cutting workpiece material having a hardness of up to at most 45 Rockwell and a tensile strength of up to at most 1500 N/mm²" is simply a statement of intended use. As the drill of Leyendecker et al. is coated using the method / coating claimed by the applicant, the drill of Leyendecker et al. having the "homogeneous" coating would have been capable of performing the claimed function.

25. Leyendecker et al. teach all the limitations of Claim 29 as set forth in paragraphs 18 and 24 above, except a method wherein the tool bodies are tools for working quenched steels, highly alloyed steels, stainless steels, or non-ferrous metals. However, simply stating that the tool bodies are tools for working quenched steels, highly alloyed steels, stainless steels, or non-ferrous metals is a statement of intended use and is not read into the claim. In addition, as the drill of Leyendecker et al. is coated using the method / coating claimed by the applicant, the drill of Leyendecker et al. having the "homogeneous" coating would have been capable of performing the claimed function.

26. Regarding Claims 30 – 31, Leyendecker et al. teach coating a drill with a homogeneous (Ti,Al)N coating (Example 1). One of ordinary skill in the art would have coated the drill with a coating having a concentration difference of at most 2 at% in order to achieve the homogeneous coating of Leyendecker et al. for the

reasons set forth in paragraph 23 above. In addition, the limitations that the cutting edge of the tool is being loaded simultaneously with different cutting speeds relative to a worked workpiece (Claim 30), and that the minimum cutting speed occurs at a tip of the drill and significantly higher cutting speed occurs at a circumference of the drill (Claim 31) appear to be limitations which are met by any generic drill. As such, the homogeneously coated drill of Leyendecker et al. meets these limitations.

However, if not all drills meet these limitations, it would have been obvious to one of ordinary skill in the art to coat the drills that do meet the limitations with the reasonable expectation of success, as Leyendecker et al. teach the coating of drills in general, which would have been expected to encompass a specific species (i.e., type) of drill.

27. Leyendecker et al. teach all the limitations of Claim 37 as set forth in paragraphs 18 and 23 above. While Leyendecker et al. do not explicitly teach that the composition difference is at most 1 at%, it would have been obvious to one of ordinary skill in the art to coat the drill with a coating having a composition difference of at most 2 at% in order to achieve the homogeneous coating of Leyendecker et al. for the reasons set forth in paragraph 23 above. Further, it would have been obvious to one of ordinary skill in the art to coat the drill of Leyendecker et al. in the comparative example of Example 1 to have a composition difference of not only at most 2 at%, but of at most 1 at%, with the reasonable expectation of obtaining a drill having as "homogeneous" a coating as possible as desired by Leyendecker et al. in their comparative example of Example 1.

28. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over
Leyendecker et al. (USPN 5,272,014) in view of Hofmann et al. (USPN 5,330,853).
29. Leyendecker et al. teach all the limitations of Claim 23 as set forth in paragraph 18
above, except for a method further comprising the step of forming the coating
having a composition difference of at most 2 at% by establishing a specific claimed
ratio of substrate bias voltage to partial pressure of the reactive gas during the
vacuum coating process. However, Leyendecker et al. do teach coating a drill with a
homogeneous (Ti,Al)N coating (Example 1). One of ordinary skill in the art would
have coated the drill with a coating having a concentration difference of at most 2
at% in order to achieve the homogeneous coating of Leyendecker et al. for the
reasons set forth in paragraph 23 above. Leyendecker et al. also teach that,
traditionally, coating process conditions were adjusted in order to form a
homogeneous coating which was believed to afford superior performance (Col.1,
lines 59 – 63), and that known coating techniques utilize a weak electric field to
prevent inhomogeneity at the edges of the substrate (Col.2, lines 16 – 20). Hofmann
et al. teach that, in the field of depositing protective (Ti,Al)N coatings on tool bodies,
the partial pressure of the reactive gas (i.e., nitrogen) and the substrate bias voltage
are particularly influential deposition parameters (i.e., they are result / effective
variables) (Col.1, lines 33 – 47). Therefore, it would have been obvious to one of
ordinary skill in the art to optimize the result / effective variables of partial pressure
of the reactive gas (i.e., nitrogen) and the substrate bias voltage through routine

Art Unit: 1762

experimentation. By optimizing both variables, the ratio of the variables would have inherently been optimized as well. The specific ranges of the substrate bias voltage and the partial pressure of the reactive gas would depend on whether the purveyor in the art desired a uniform coating or a coating having a composition difference at the edge of the tool. Both embodiments are taught by Leyendecker et al. in

Example 1.

30. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Leyendecker et al. (USPN 5,272,014) in view of Hofmann et al. (USPN 5,330,853) in further view of Munz et al. (USPN 4,426,267).
31. The combination of Leyendecker et al. and Hofmann et al. teach all the limitations of Claim 24 as set forth in paragraph 29 above, except a method which includes selecting ground potential as the electric reference potential. Leyendecker et al. and Hofmann et al. are silent in regards to this point, but both teach utilizing a bias voltage. However, Munz et al. teach that, in the field of sputter coating a substrate, it is known to choose a substrate bias voltage with respect to ground (Col.3, lines 32 – 39, Col.4, lines 40 – 42). Therefore, it would have been obvious to one of ordinary skill in the art to do so with the reasonable expectation of success.
32. Claims 26 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leyendecker et al. (USPN 5,272,014) in view of Breuer et al. (USPN 5,125,775).

Art Unit: 1762

33. Leyendecker et al. teach all the limitations of Claims 26 and 35 as set forth in paragraph 18 above, except a method wherein the coating having a composition difference of more than 2 at% between the first hard material coating and the second hard material coating is deposited on the specific claimed tools. However, Leyendecker et al. teach that the inhomogeneous coating (i.e., the coating wherein the first hard material coating has a content of at least two of the metal elements to be different from the content of the two metal elements of the second hard material by more than 2at%) is useful when coating cutting tools, milling tools, shaping tools, punches, drills, and similar apparatuses (Col.2, lines 61 – 68, and Col.3, lines 1 – 10). Regarding Claims 26 and 35, Breuer et al. teach that ball-end milling cutters and shank-type milling cutters were known at the time of the applicant's invention (Col.1). It would have been obvious to one of ordinary skill in the art to coat the ball-end and shank-type milling cutters of Breuer et al. with the coating method / composition of Leyendecker et al. with the reasonable expectation of (1) success, as Leyendecker et al. teach that cutting tools and milling tools in general are coated by their invention, and (2) obtaining the wear-resistance benefits of the coating of Leyendecker et al. on the specific cutting tools taught by Breuer et al. Also, the limitation that the ball-end milling cutters and shank-type milling cutters of Claim 35 are to be used in specific applications (i.e., working specific materials) is simply a statement of intended use and is thus not read into the claim.

34. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Leyendecker et al. (USPN 5,272,014) in view of Imanaga (USPN 5,125,775).
35. Leyendecker et al. teach all the limitations of Claim 34 as set forth in paragraphs 18 and 23 above, except a method wherein the coating having a composition difference of at most 2 at% between the first hard material coating and the second hard material coating is deposited on the specific claimed tools. However, Leyendecker et al. teach coating a drill with a homogeneous (Ti,Al)N coating (Example 1). One of ordinary skill in the art would have coated the drill with a coating having a concentration difference of at most 2 at% in order to achieve the homogeneous coating of Leyendecker et al. for the reasons set forth in paragraph 23 above. Imanaga et al. teach that HSS drills were known at the time of the applicant's invention (Col. 1). It would have been obvious to one of ordinary skill in the art to choose the drill coated in Leyendecker et al.'s comparative example in Example 1 to be a HSS drill as taught by Imanaga et al. with the reasonable expectation of success, as Leyendecker et al. teach coating a drill in general. In Claim 34, the fact that the HSS drills are for working specific materials is simply a statement of intended use and is not read into the claim.

Conclusion

36. In conclusion, the applicant is asked to note that Leyendecker et al. teach that both methods of coating tool components claimed by the applicant (i.e., the "homogeneous coating" and the "inhomogeneous coating" having a different

Art Unit: 1762

composition at the edge of the tool than elsewhere on the tool body) were known in the art at the time of the applicant's invention (whole document). Leyendecker et al. also teach both methods have advantages and disadvantages (Col.3, lines 28 – 40). The mere observation of still another beneficial result in an old process cannot form the basis of patentability (*Allen et al. V Coe*, 57 USPQ 136).

37. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesley D Markham whose telephone number is (703) 308-7557. The examiner can normally be reached on Monday - Friday, 8:00 AM to 4:30 PM.
38. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.
39. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

WDM

WDM
November 20, 2001

Wesley D Markham
Examiner
Art Unit 1762

SPB

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